ENERGY – POLAND

Prepared in March 2000

I. Statistical Information -- Primary Energy Consumption

1998	Ktoe(1)	%
Coal	67,083	69
Petroleum	16,263	16.7
Natural Gas	9,514	9.8
Hydro/Wind	198	0.2
Nuclear	0	0
Other (2)	4,144	4.3
TOTAL	97,202	100.0

(1) thousand tons of oil equivalent
(2) includes peat and wood, geothermal, biogas, biomass, solid and liquid waste

II. Evaluation of Sector -- Electrical Power Systems, Oil and Gas Field Machinery and Services and Renewable Energy Equipment

A) On a scale of 1 (low) to 5 (high), evaluate the priority given by the host government to energy development: 5

B) On a scale of 1 (low) to 5 (high), evaluate country's receptivity to U.S. products & services: 5

C) On a scale of 1 (heavy) to 5 (little), evaluate competition for U.S. exporters from local domestic suppliers: 2

D) On a scale of 1 (heavy) to 5 (little), evaluate competition for U.S. exporters from third-country suppliers: 1

E) On a scale of 1 (severe) to 5 (little), evaluate overall effect of trade barriers on U.S. exports of products and services: 2

III. Narrative Information

The Polish energy sector offers significant opportunities for U.S. companies due to the restructurization and modernization process initiated in 1990. The fuel and power industries in Poland have required about USD 50 billion in investment in order to become efficient, financially profitable and compatible with worldwide environmental standards. Privatization of the oil and electrical power industries opens new investment opportunities for U.S. companies. The privatization of power generation facilities has already started and is planned for completion in 2002. Four power plants have been privatized so far, and several other privatizations are in process. The oil sector is in the process of privatization of oil processing and distribution facilities. The gas sector is still controlled by the Polish Oil and Gas Company, a state owned company. However, the new Energy Law, which came into force in December 1997, has opened the way for future privatization of the entire energy sector.

The Polish energy sector is undergoing serious transformations in order to compete with more developed countries. Following are highlights of the Polish government's priorities in the energy sector for the coming years:

- Construction of underground natural gas storage facilities for retaining strategic reserves of gas and equalizing demand for natural gas throughout the year.
- Construction of the Polish section of the transit gas pipeline from the Yamal Peninsula in Russia to Western Europe, in cooperation with Russian Gazprom.
- Identification of alternative sources of gas supply.
- Development of domestic gas production to an economically reasonable level, including extraction of coal bed methane.
- Adjustment of hard coal production to levels that will allow state subsidies to be canceled.
- Investments in the power sector - upgrading of existing and construction of new facilities, assuring economic security in the electric energy supply.
- Shifting to new primary energy sources by increasing the use of liquid and gas fuels.
- Increase in efficiency of power sector enterprises.
- Rationalization of energy consumption
- Reduction of sulfur dioxide emissions to 700 thousand tons per year by 2010. -- Improvement in the utilization of ashes and other wastes from power generation facilities, and their safe storage in abandoned mines.
- Introduction and full implementation of the market mechanism into the energy sector, including competition where possible, while justifying supply safety and economic effectiveness. In areas where market impact is limited, energy activities will be regulated by the state regulating agency.
- Adjustment of legal regulations in the energy sector to the rules of the European Union as well as the European Energy Charter and Energy Card Treaty signed by Poland.

Electrical Power Generation and Transmission Equipment

1998	Capacity MW	Product. Gwh
Thermal	33,726	138,792
Hydro	2,008	3,816
Renewable		8
Total	35,734	142,616

Poland's total primary energy consumption of 97 million toe (ton of energy equivalent) in 1998 ranked it as the number one energy consuming nation among the Central and Eastern Europe countries (Poland's energy consumption is equivalent to one third of the total energy consumption of all these countries). It is estimated that total energy consumption in Poland will increase to 138 toe by 2010. However, Poland is an inefficient energy consumer; up to 30 percent of energy generated is lost. Poland uses about 70% of the EU's average energy consumption per capita.

The Polish electrical power sector consists of three subsectors: generation, transmission and distribution, and as such is the largest in Central and Eastern Europe. The installed generating capacity of Polish power stations is 35,734 MW. Gross domestic production of electricity reached 142,616 Gwh in 1998. The sector is currently undergoing significant changes on the way to demonopolization, market liberalization and privatization. In the near future, a fourth subsector, electric energy trade, will appear.

Power Generation

Out of a total of 33,726 MW thermal generation capacity, 30,759 MW are installed in public power stations and 2,967 MW in industrial power stations (auto producers). The public power generation sector primarily consists of 55 thermal power plants, 33 of which are combined heat and power plants (CHPs). The generation capacity of thermal power plants accounts for 93 percent of total public power station capacity. The remaining 7 percent (2040 MW) belongs to hydroelectric power plants.

Hard coal fired public power stations account for 56.6% of total installed capacity, lignite-fired public power stations represent 27.5%, industrial power stations, 9.9% and hydropower stations, 6%. All thermal power plants in Poland are coal fired. Fifty five percent are hard coal fired and 42 percent are lignite (the remaining 3 percent are hydro power plants). Ninety seven percent of electricity in Poland is produced from coal. About 40 percent of Poland's electricity production comes from 5 generating plants which burn 65 million tons of lignite per year, consuming the entire output of Poland's lignite mines. These plants are built adjacent to lignite pit mines, and the coal is often fed directly from pit to boiler on a conveyor belt. Seventeen electric generating plants, 33 cogeneration plants and 220 industrial

generators burn about 44 million tons per year of hard coal (out of a total of 140 million tons mined). It is estimated that coal will remain the main domestic source of energy until 2010. The Polish government plans to restructure and reform the industry to cut coal production from 140 million tons in 1995 to 120 million tons by 2000. Thus, coal's share in primary energy will decrease continually between 2000 - 2010 by approximately 0.5% per year. This share will be replaced by natural gas and oil. Efforts are being made to provide natural gas to areas that do not presently have it. Poland intends to reduce its overwhelming dependence on domestic coal and on foreign imports of other types of energy.

There are no nuclear-powered generating plants in operation in Poland. Construction of a nuclear power plant in Zarnowiec (in northern Poland) was started in the 1980s. However, following the disaster at Chernobyl, construction of the plant was halted in 1990. There are no plans for nuclear facilities for the next twenty years. The government's policy aims at the diversification of fuels used in Polish power generation. There are several natural gas fired power plant projects currently under development in Poland, including the construction of new power plants and the modernization of existing facilities. The first gas fired IPP developed by U.S. company Enron has been completed and will be fully operational this year.

The potential capacity of Polish hydroelectric energy generation is 12-13 Twh annually, but only about 15% of hydroelectric capacity is presently utilized. The total installed power capacity of hydro power plants in Poland amounts to 2008 MW, which is about 7.3% of the capacity of the national power system. Out of 21 hydro power plants, only 11 have a capacity of more than 10 MW. Four are peak-pump storage power plants. In contrast to thermal power plants, which dominate in Poland, hydro power plants have considerable capabilities in regulating their output of power. Therefore, despite the relatively small contribution of hydro power to electricity generation in Poland (3 percent of total electricity production), the big hydro power plants are of the greatest importance for regulation of power in the national power system. This particular role is played by the pump-storage power plants and hydro power plants with pumping units which, during off-peak periods, pump water to their upper reservoirs in order to give energy back to a grid during peak power load times.

Single generation units of Polish power plants have capacities of 120 MW, 200 MW, 360 MW, and 500 MW. Heat is generated through heat units that have 50 and 100 MW capacities. Power is generated at an average of 490 MW. CHP stations consist of cogeneration blocks backed up by "heat only" boilers. The largest power station (Belchatow) generates 4320 MW with 12 units of 360 MW each. The greatest power output of a single power generating unit is 500 MW, at the Kozienice power station. The main generation units are boiler-turbine units of the following capacities: 2 units of 500 MW, 12 units of 360 MW, 63 units of 200 MW and 24 units of 120 MW. The dominance of coal as the major energy carrier results in high levels of environmental pollution.

Power Transmission and Distribution

The power transmission system comprises 12,692 km of lines, including 27 km of 110 kV, 7,901 km of 220 kV lines, 4,677 km of 400 kV lines, and 114 km of 750 kV extra high voltage lines. The installed capacity of the transmission grid transformers is 32,152 MVA. The transmission system is linked by extra high voltage interconnections with the power systems of neighboring countries. The Polish Power Grid Company (PPGC) is the owner of

the power transmission network. PPGC represents 10% of Polish electrical power sector assets.

The national distribution system consists of 300,309 km of 1-110 kV lines and 368,268 km of low voltage lines (below 1 kV). Distribution activity is performed by 33 distribution companies that supply electricity to 14.7 million customers, including 12.9 million households in urban and rural areas. In 1998, electricity consumption by households amounted to 19,771 GWh. Distribution companies represent 40% of Polish electrical power sector assets.

The Polish electrical power system is a part of the CENTREL system, which includes the Czech Republic, Slovakia and Hungary. In 1995, CENTREL was connected with UCPTE, a western European system that has exchange capacity of 3000 MW. Poland also has connections to Ukraine and Belarus. Direct lines between Sweden and Poland are under construction and negotiations have started with Russia and Lithuania about creating power connections to those countries. In 1998 Poland exported 7542 Gwh of electricity and imported 5357 Gwh. Poland's export markets include Austria, Switzerland, Hungary, the Czech Republic and Slovakia.

Major Trends and Government Policy

The major trends in the power generation sector include the liberalization of the electric energy market as well as demonopolization and privatization of sector enterprises. The new Energy Law, passed by the Parliament on April 10, 1997, came into force in December 1997. Most of the supplementary legislation and regulations, which are necessary for the support of implementation of the new law, are already in place.

The Energy Law defines the principles for developing a national energy policy, the principles and terms for the supply and use of fuels and energy, including heat and the operation of energy enterprises. It also designates the organizations that have jurisdiction over issues of fuel and energy economy. The purpose of the law is to create conditions that will provide energy security, efficient and rational use of fuels and energy, development of competition, counteraction of the negative consequences of the existence of natural monopolies, environmental protection, customer interests and minimizing of costs.

The Energy Law defines the conditions for conducting economic activities in the energy sector, imposes certain obligations on economic entities and guarantees them certain rights. The key provisions of the law include:

-- establishing a solid legal framework defining the rights and duties of producers, distributors and users of energy and putting licensing procedures into place;
-- setting up an independent regulatory entity which ensures competition within the energy sector;
-- guaranteeing Third Party Access (TPA) of enterprises to energy distribution grids or pipelines, provided the third parties produce energy domestically and have met contractual and governmental obligations.

The major task of the new law is to introduce a competitive market in the electric energy and gas industries. Under the law, energy enterprises must sign contracts for delivery of electric

energy, gas and heat and must follow the TPA rule allowing all domestic energy entities equal access to the electricity and gas networks. The TPA rule is limited only to electricity and gas produced domestically. TPA enables end-users to sign power purchase contracts directly with power producers and power supply companies. The law creates the legal framework to develop the fourth electric energy market segment, electric power trading, in addition to production, transmission and distribution. In practice, this means that when an end-user is not satisfied with its energy company service, it will have the choice to turn to another electricity supplier. The owner of the electricity distribution network in the region will be obliged to render access to the distribution grid for another supplier (based on a fee). Also, the Polish Power Grid Company will have to make their high voltage power grid accessible to other power trading companies.

Another fundamental change brought by the new law is the introduction of a licensing system for the energy sector. The Energy Regulatory Office (ERO) has been established to issue licenses for electricity, gas and heat production, transmission, distribution and domestic trade. The ERO also verifies and controls tariffs, supervises the contracts for power supply and intervenes with natural monopolies such as the power grid. The ERO consists of seven members, and the head of the ERA is appointed by the Prime Minister. Foreign trade in gas and electricity requires a license from the Ministry of Economy, and the necessary intermediary of Polish Oil and Gas Company (gas) and Polish Power Grid (electricity) is required in local distribution.

The new law states that the Ministry of Economy is responsible for overall national energy policy, while the ERO has regulatory rights. A new mechanism for setting energy prices has been established. The government has gradually moved away from centrally set prices in favor of prices resulting from competition and determined by energy producers under the supervision of the ERO. In June 2000, the electric energy exchange will start operation in Poland. Initially, the energy exchange will control spot transactions.

The privatization of power generation and distribution companies is also under way. Hopefully, all power plants and CHPs, as well as energy distribution companies, should be privatized by 2002. The privatization of electric energy transmission is planned for a later date.

Five Polish power plants have been privatized to date, and several other privatizations are in the process of being completed. The first privatization took place in October 1997, when the French consortium Electricite de France (EDF) signed an agreement with the Ministry of State Treasury to purchase a 55% stake in Krakow CHP. Other privatized companies include: the Patnow Adamow Konin PAK power plant - 20 percent of PAK shares were sold to the Polish company Elektrim, Bedzin CHP plant – company shares sold through the Warsaw Stock Exchange, Warsaw CHP group of plants – 55% of shares sold to Vattenfall of Sweden, Polaniec power plant - sold to Tractabel of France. The sale of 35% of Rybnik power plant shares to the consortium of U.S. companies NRG and GE Capital and Merubeni of Japan is at the very final stage. By the end of 2002, the Ministry of State Treasury plans to sell 17 power plants, 19 CHP plants and 33 distribution companies.

Many large international energy companies have established a presence in Poland in order to take part in the modernization and expansion of the energy sector. The U.S. company Enron has invested USD 120 million for the first gas fired IPP in Poland. The CHP plant in Nowa

Sarzyna will become fully operational this year. PSEG Global of the U.S. has started the construction of a 220 MW coal-fired CHP plant in Chorzow. A joint venture including U.S. company AES Electric is in the final stage of preparations for construction of a gas-fired power plant on Zarnowiec Lake in northern Poland. The plant will be built in stages and will ultimately have a capacity of 1000 MW. The total project cost is estimated at USD 1 billion.

Electrical Power Equipment

The Polish market presents significant sales opportunities for U.S. companies that manufacture electrical power equipment, as Polish companies are familiar with and extremely receptive to U.S. products in the power sector. U.S. companies excel at providing needed equipment, including coal-fired fluidized-bed combustors, pollution control equipment, pumps and compressors, electrical systems, heat recovery systems, turbine generators and gas and steam turbines.

The U.S. is particularly strong in cogeneration and clean-coal technology, two primary areas of interest to the Poland power sector. U.S. manufacturers will also benefit from the heavy environmental emphasis of this strategy. Power plants in the U.S. have been demanding efficient "green" equipment for decades, forcing U.S. manufacturers to improve their designs and environmental capabilities as well as the cost effectiveness of U.S. produced power generating equipment.

U.S. firms are facing competition from European firms as well as Polish manufacturers of power generating equipment. Large international groups have been examining investment and sales opportunities in Poland. Three of them, ABB (Swiss-Swedish), AEG (German) and Ahlstrom (Finland) have made investments in Polish power generation equipment manufacturers and have acquired control of the market for domestically produced products. Westinghouse - Siemens and Foster Wheeler of U.S. also have significant positions in the market. They are engaged in many power plant refurbishment projects and joint ventures with Polish manufacturers of generation equipment.

The power engineering sector in Poland comprises primarily seven manufacturers, which are supplied by a wide range of other engineering companies. There are three producers of industrial and utility boilers: Rafako, Foster Wheeler Energy Fakop and Sefako. ABB Zamech is Poland's sole producer of power station turbines, and ABB Dolmel is the country's only supplier of power station generators. In transformers, local production is dominated by ABB Elta and Mefta. The following table presents statistical information on the market for electric power generation and transmission equipment in Poland:

USD Millions (* unofficial estimates)

	1998	1999*	2000*
Total Market Size	1,500	1,550	1,590
Total Local Production	1,300	1,400	1,440
Total Exports	350	450	450
Total Imports	550	600	600
Imports from the U.S.	25	30	30

Oil & Gas Industry and Equipment Market

Poland has limited oil deposits. Total onshore reserves amount to 5 million tons. Domestic reserves are found in the south of the country, near the Carpathian mountains. Out of the 210,000 tons of crude oil extracted onshore in Poland annually, some 90,000 tons come from this region. Other reserves are in northwestern Poland.

Local production of crude oil in Poland ranges between 150,000 - 300,000 tons annually, which accounts for 1-2% market's needs. An overwhelming majority of crude oil is imported, mainly from Russia, the United Kingdom, Iran and Norway. Domestic output is produced by the Polish Oil and Gas Company (POGC). There are also foreign and private companies that have licences for oil exploration and exploitation in Poland. Ultimately, these companies will incorporate their production into domestic output.

The Oil Pipeline Exploitation Enterprise (PERN), a state-owned company, manages all but one of the Polish crude oil and oil product pipelines, including the "Friendship" pipeline from Russia to Germany. The "Friendship" pipeline runs East to West across Poland, through Plock, and onwards to the Schwedt Refinery in Germany. Also, there is a crude oil pipeline linking the two major Polish refineries: Plock and Gdansk. PERN earns approximately USD 85 million annually on Russian crude oil transported to German refineries. There are three product pipelines running from Plock.

The Polish oil industry processed 16.2 million tons of crude oil in 1998 at seven refineries. About 99 percent of the oil processed is imported, mainly via pipeline from Russia and Kazakhstan, and by ship from the North Sea and the Middle East.

The two largest refineries are the Petrochemia Plock Mazovian Refinery and Petrochemical Plant (build in 1964), with an annual capacity of 12.6 million tons, and Gdansk Refinery (built in 1975) with an annual capacity of 2.8 million tons. The other five refineries are: Silesian Refining Works in Czechowice, Trzebinia Refinery in Trzebinia, Refining Works in Jaslo, Oil Refinery Jedlicze in Jedlicze and Oil Refinery Glimar in Gorlice. All five refineries are located in Southern Poland and processed only 9.5% of crude oil in Poland in 1997. All of them were constructed in the 1800s. The construction of a new refinery in the South of Poland, in Kedzierzyn-Kozle, is planned in the future. Annual oil consumption in Poland is approximately 400 kg per capita, one of the lowest in Europe.

Tremendous efforts have been made in order to limit problems faced by the petroleum industry in Poland, including lack of capital, obsolete technology, poor energy efficiency, excessive use of raw materials, low utilization of existing capacity (below 80 percent) and burdens on the environment. The Polish oil industry has been undergoing restructuring in order to face foreign competition after the abolishment of oil and fuel import duties, quotas and licenses. The total cost of downstream sector restructurization is estimated at USD 2.5 billion.

The largest Polish refinery, Petrochemia Plock, has invested a total of USD 390 million in the construction of a new hydro cracking installation. The new facility will allow the refinery to increase production of refined oil from 10.6 million tons to 12.6 million tons annually, gasoline production by around 20 percent and diesel fuel output by 46 percent. In 1999, the refinery ceased production of leaded fuel. The new installation will improve the quality of

Petrochemia Plock's production so that it is equal to that of German refineries, which are the major competitors for Polish producers in the local market.

The second largest Polish refinery, Rafineria Gdansk, is also undergoing a tremendous modernization program. The modernization and refitting of the refinery will total USD 1 billion. As a result of this program, the production capacity will increase from 2.8 million tons to 3.5 million tons annually. This work has been undertaken to enhance the product's quality and energy efficiency. The construction of a hydro cracking facility has increased production capacity to 4.5 million tons in 2000. Rafineria Gdansk has also installed sulfur-extraction technology. This USD 10 million project has been developed by the British subsidiary of the U.S. firm Parsons.

The government's restructuring and privatization program for the oil industry is mostly concerned with the downstream sector, including oil processing, distribution, and retailing. The upstream sector, oil exploration and production, is already subject to a licensing procedure. Many foreign oil companies are interested in exploration and drilling for oil and gas in Poland and have obtained licenses for exploration and production.

The largest Polish refinery, Petrochemia Plock, has merged with the fuel distributing and retailing company CPN to create a national oil concern – Polish Oil Concern PKN. PKN controls about 1973 gas stations and owns about 30% of the market in Poland. At the end of 1999, 30% of PKN shares were offered at the Warsaw Stock Exchange and foreign exchange markets. Another 20-30% of shares will be floated on the stock exchange in the second half of 2000. The State Treasury Ministry currently owns 44% of company shares. After an unsuccessful attempt to sell Gdansk Refinery to a strategic investor in 1999, a new privatization strategy is being currently developed for this company by an advisor selected by PKN.

Natural gas reserves in Poland amount to 150 billion cubic meters. In 1998, 10.4 billion cubic meters of natural gas was consumed in Poland, out of which 3.7 billion cubic meters came from domestic sources. Sixty percent of natural gas used in Poland is imported and 40% is produced locally. Almost all imports come from Russia, with marginal shares coming from Germany and the Czech Republic. All Polish natural gas importation, transmission, storage and distribution are controlled by the Polish Oil and Gas Company (POGC), which is still government owned. Until 1991, POGC also had a monopoly on oil and gas exploration. At that time, licensing for oil and gas exploration was opened to foreign companies. In order to reduce the overwhelming dependence on domestic coal and imports of gas, Poland intends to develop exploration and production of methane gas from hard coal deposits in the Silesia region. Several U.S. and foreign companies are involved in exploration for oil, natural gas and methane in Poland.

The total length of the gas main system has reached 96,100 km, including 17,700 km of high-pressure gas supply mains and 78,400 km of distribution gas mains of medium and low pressure. A total of 6.5 m households are connected to the gas network, as are 2,200 industrial clients. Gas is supplied to 3,790 locations, including 520 towns. The consumption of natural gas has been growing during the last two years. In 1995, 422 km of household gas supply pipeline was brought into service, and about 4,000 km of medium and low-pressure distribution gas pipeline. As a result of gas pipeline development the usage of high-methane natural gas is expected to increase significantly.

In 1998, high methane gas accounted for 80.8% of gas used in Poland (nitrogen-hardened natural gas accounted for 18.2% and coke-oven gas for 1%). By the year 2010, an additional 10,000 km of gas supply mains and an additional 42,000 km of the distribution network are planned for construction. This will increase the length of gas supply mains to about 27,800 km and distribution gas pipelines to about 121,400 km. The total length of the supply system will increase to about 148,200 km. In addition, 1,400 measuring and reduction stations will be built, providing a total of 5,300 such stations servicing the system.

According to government forecasts, by 2010 gas consumption will increase to 22-27 billion cubic meters annually. To meet the increasing requirements for gas, Poland is participating in the construction of the Yamal transit gas pipeline from Siberia to Western Europe. Poland will receive up to 13 billion cubic meters of gas annually through the Yamal pipeline. This transit gas pipeline, more than 4,000 km long, will carry natural gas supplies from the richest Siberian reserves to Germany and other western European countries across the territories of Russia, Belarus and Poland. The cost of this enormous project is estimated at USD 35 billion. The construction cost of the Polish section of the pipeline is estimated at USD 2.5 billion, making it the largest infrastructure investment in Poland to date. The Polish section of pipeline will run from Kondratki, on the Polish border with Belarus, to the German border town of Gorzyca and will carry 65.7 BCM of natural gas. Two parallel lines of gas pipeline are going to be built, each 665 km long. Construction of the first pipeline was completed at the end of 1999, and should become fully operational in 2000, together with construction of five compressor stations. The second line will be completed in 2010. The construction of both lines is divided into several parts. The Yamal pipeline project creates certain opportunities for U.S. manufacturers of pipeline equipment.

The cumulative underground gas storage capacity target for 2010 will cover about 15 percent of national consumption (i.e., 3.2 billion cubic meters per year for 22 billion cubic meters of annual national consumption). This requires the construction of new underground gas storage tanks. There are several facilities under construction, including Mogilno, Husow and Wierzchowice. In addition to these projects, there are plans to construct underground gas storage tanks near the Baltic Sea, on the Hel Peninsula. There are salt deposits in the Hel area that are appropriate for setting up gas storage tanks.

It is estimated that electricity consumption in Poland will increase by 40 percent by 2010. Currently, production of electricity based on natural gas in very limited in Poland. However, increased gas reserves would provide an alternative choice of supply for power generation. Nowa Sarzyna CHP plant, which becomes operational this year, is the first gas fired power plant in Poland. Several projects are under way to develop gas-fired combined heat and power plants, including a gas-fired cogeneration plant, which will be built at Zarnowiec Lake, the Zamosc CHP, Gorzow CHP and many others. POGC estimates the total gas supply from power plants will be 7 billion cubic meters by 2010.

The new Energy Law opens the way for the free market in the energy and gas sectors. The monopoly position of POGC will no longer exist, since POGC will not be the only gas buyer in the Polish market. POGC will have to make available their pipeline network for other companies doing business in gas production and trading. Gas prices will be freed during next two years, and contract gas prices will be subject to trade negotiations between gas producers and buyers.

Renewable Energy

The renewable energy sector is marginal in Poland. However, this subsector is beginning to develop. There are about 10 small hydro power plants of capacity below 10 MW. There are some projects using other renewable energy carriers, including peat and wood, geothermal, biomass, biogas, solid and liquid waste. There is a great potential for geothermal and biomass energy. Geothermal energy resources in Poland are estimated to be significant, especially in the southern part of the country. Geothermal waters with a temperature of 70 degrees Celsius or more can be utilized in winter for heating purposes. According to some experts, Poland's geothermal energy resources are sufficient to satisfy all of the country's heating needs. There are several pilot projects in this area, including in the Podhale mountain region. The World Bank in Poland is involved in preparatory work for several possible renewable energy projects, including use of geothermal energy resources. Project sites are located in the Zakopane, Skierniewice, Stargard and Szczecin areas.

Analysis indicates that after introduction of world prices for natural gas, the production of biogas will be fully profitable. Polish biogas production potential is estimated at about 5-6 billion cubic meters annually. The CHP plant in Ostroleka has started an installation utilizing tree bark. Wind and solar energy are not utilized in Poland on a sizable scale. Solid waste fuels and bio fuels are also little used.

Poland is interested in exploration of opportunities in thermal energy development and small hydro power plants. Other renewable energy is of marginal importance in Poland.

IV. Private Projects and Procurement Opportunities for Small and Medium Sized U.S. Companies on the Horizon (next 18-36 months)

Private Projects

1. Enron International, through its affiliate, Elektrocieplownia Nowa Sarzyna Sp. z o.o. (ENS) has developed a combined heat and power plant in Nowa Sarzyna (in the south of Poland). The US 130 million, 116-megawatt plant is beginning operation in spring 2000. The plant is located on the grounds of the "Organika-Sarzyna" Chemical Works. ENS provides steam to "Organika-Sarzyna" Chemical Works and to the city of Nowa Sarzyna, and electricity to national grid (based on a 20-year power purchase agreement with Polish Power Grid Company). This is Poland's first natural gas fired independent power project.

Project Contact:
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Mr. Jarek Astramowicz, President

2. The consortium of U.S. companies Zarnowiecka Elektorwnia Gazowa ZEG, has been developing a combined cycle gas fired electrical generating facility to be built on the site of an uncompleted nuclear power plant on Lake Zarnowiec. The total investment is estimated at

USD one billion. ZEG is in the process of negotiating the power purchase agreement with the Polish Power Grid Company and the gas supply arrangement with the Polish Oil and Gas Company.

Project contact:
AES Electric Poland
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fax. (480(22) 622-38-78
Mr. Jacek Sawicki, Director

3. The joint venture of U.S. company PSEG Global and Chorzow CHP Plant, called ELCHO, is beginning the construction of 220 MW coal fired thermal plant in Chorzow. Construction will be performed by Foster Wheeler company. The new plant will use modern fluidized bed boiler technology. Total investment cost is estimated at USD 320 million. The new plant will become fully operational at the beginning of 2003.

Project contact:
PSEG Global
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Fax. (44) (171) 744 0177
Mr. John Protasiewicz, Project Development

Procurement Opportunities for Small and Medium Sized U.S. Companies

1. Polskie Sieci Elektroenergetyczne S.A. (Polish Power Grid Company) is organizing an open bid for the preparation of technical, formal and legal documentation and construction at Dobrzen – Wielopole of a 400 kV double-track overhead transmission line in the section from tension pole No. 48 to the incision of the Wielopole – Albrechcice 400 kV line. The subject of the bid is described in details in the bidding documents. Contract execution is planned for the period August 23, 1999 – July 31, 2002. The line is planned to be in service by August 31, 2002, only after a successful 72 hours of test operation has been conducted.

Contact:
Mrs. Malgorzata Domanska
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2. Procurement under the World Bank tender procedures financed from the USD 160 million IBRD loan approved for The Polish Power Grid Company, Poland's power transmission company. The type of equipment purchased under this loan includes: composite overhead ground wires with single mode optical fibers (OPGW), metal enclosed switch gears, shunt reactors, transformers, pipe conductors, cicruit breakers, 400 kV, 220 kV and 110kV surge arresters, disconnectors and earthing switches.

Procurement Contact:
Pion Zakupow Przetargowych Polskich Sieci Elektroenergetycznych S.A.
Bid Department of Polish Power Grid Company)
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tel. (48)(22) 693-2504
fax. (48)(22) 693-2467
Ms. Malgorzata Domanska

3. Procurement under the World Bank tender procedures financed from the IBRD loan approved for Heat and Power Plant Rybnik S.A. for the purpose of plant rehabilitation. Equipment purchased: spray steam desuperheaters.

Procurement Contact:
Energy Management and Conservation Agency
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tel. (48)(22) 625-59-47
fax. (48)(22) 625-44-96
Contact: Mr. Krzysztof Grzywacz

4. Procurement under the World Bank tender procedures financed from the IBRD loan approved for the Capital Region Heating Enterprise in Warsaw SPEC for the heat supply restructuring project. The type of equipment purchased under this loan include: telemetry system, compact substations.

Procurement Contact:
Stoleczne Przedsiebiorstwo Energetyki Cieplnej SPEC
Joint Procurement Unit Bureau, Room 906
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Warsaw, Poland
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5. Okregowe Przedsiebiorstwo Energetyki Cieplnej Sp z o.o. (OPEC), the District Heating Enterprise) in Gdynia has announced open bidding for the heat supply restructuring and conservation project in Gdynia. The OPEC Ltd. has signed a total loan for USD 25 million with the World Bank for the implementation of this project. The proceeds of the loan are intended to be used for various products, like ultrasonic heat meters,balancing valves for restructuring projects,etc.

Procuring Entity
OPEC
81-213 Gdynia
ul. Opata Hackiego 14
fax. (48)(58) 623-32-23
tel. (48)(58) 623-48-60

6. The Turow power plant is in the modernization process. The third stage of modernization is planned for 2000-2001. Investment will financed by commercial loans and bonds issuance.

Turow has received a loan of USD100 million from a consortium of European banks including Citibank, WestDeutsche Landesbank and Credit Lyonnais. Company also plans to issue USD250 million worth of eurobonds by the end of June 2000.

Turow Power Plant
Elektrownia Turow
Radomierzyce
ul. Mlodych Energetykow 12
tel. (48)(75) 773 40 00, 773 40 01
fax (48)975) 773 40 02
Contact: Mr. Jerzy Łaskawiec, President

V. Major Trade Events/Fairs

Poznan International Fair, Poznan
June
Organizer: Poznan International Fair S.A.
ul. Glogowska 14
60-734 Poznan
tel. (48)(61) 869-23-55, 869-22-86
fax. (48)(61) 866-58-27, 866-09-40

This is an annual event. The Poznan International Fair is the largest industry show in Poland. Energy companies are very well represented at the show.

KATOWICE
International Fair for Mining, Power Industry, Metallurgy and Chemical Industry
September, Katowice
Organizer: Katowice International Fair S.A.
Tel. (48)(32) 204 2499
Fax. (48)(32) 254 0227

Biannual event specializing in the power industry, mining, metallurgy and chemical industry.

ECO ENERGIA
Energy and Environment Fair
April
Organized by World Trade Center Gdynia - Expo
81-341 Gdynia
ul. T. Wendy 7/9
tel. (48)(58) 286-143, 286-163
fax. (48)(58)286-164, 286-168

The annual event dedicated solely to the power industry.

POLEKO
International Environmental Fair
November, Poznan

Organized by Poznan International Fair
ul. Glogowska 14, 60-734 Poznan,
tel. (48)(61) 869-25-92
fax. (48)(61) 866-58-27

Annual event covering environmental protection technologies and services.

VI. Country's Methods of Procurement

1. Public procurement is made according to the public procurement law, which went into effect in January 1995 and introduced uniform procurement procedures for the public sector in the purchase of construction services, products, materials, supplies and services. The law also contains provisions that created a system of protests and appeals to be used as an instrument of control and to counteract corruption. Furthermore, the law granted all suppliers and contractors interested in bidding on "public orders" equal access to public procurement in Poland. Note: The term "public orders," which is used from time to time in this report, means procurement for construction work, delivery of products or materials, and the performance of services that are paid in whole or part from public funds. The law is also aimed at ensuring that Polish firms are treated equally in the public procurement process.

According to regulations which were instituted as a result of the law, public orders may be granted via one of six modes: (1) public invitation to a tender, (2) limited invitation to a tender, (3) two-phase tender, (4) negotiations with competing firms, (5) requests for price, and (6) simple order. However, public invitation to a tender is the basic mode of granting public orders. The other modes are applied only under special circumstances.

The Law on Public Orders also created the Office of Public Procurement, which has a mandate to ensure proper organization of the process of granting public orders. The President of the Public Procurement Office is appointed by the Prime Minister and is responsible for its activities. The Public Procurement Office draws up bills, issues opinions on draft legal acts within inter-ministerial agreements and makes the following administrative decisions regarding public offers:

-- whether to exclude the public from a tender when public orders exceed 200,000 ECU
-- whether to shorten the deadline for bidders to submit their bids in tender offerings
-- whether to require bidders to supply a monetary guarantee with their bids
-- whether to give consent for tenders to be drafted in a language generally used in international trade
-- whether to require, as required by regulations, to publish tender offerings in the EU Journal
-- whether to reach an agreement before a protest is filed or domestic preferences are examined

The Public Procurement Office is also responsible for overseeing arbitration, the issuing of the Public Orders Bulletin (a daily listing of procurement opportunities throughout Poland, organized by geographic location and product category), and international cooperation in the field of public orders and training.

The law's amendments of October 1997 permit a greater array of organizations to follow

public procurement regulations. These organizations include local governments and state agencies. Local governments can now follow the law's regulations and state agencies can follow the law's procedures without also being regulated by other, separate rules. The amendment also introduces the possibility of awarding joint orders on behalf of more than one municipality by a locally appointed administrative unit.

Further, the amendment allows small and medium sized companies to follow the procurement regulations provided by the law. It makes clearer the types of documents that are necessary in public procurement tenders. The amendment stipulates the scope of the application of the regulations of the Civil Code and the Administrative Procedure Code in public procurement, and spells out the circumstances in which the deadline for submitting bids on a tender can be shortened. The amendment also lowered the minimum number of bidders with whom negotiations can take place from three to two.

In addition to the changes mentioned above, the amendment also made the following additions to the law:

-- regarding public orders for construction contracts, the entity placing a public order must inform the Minister of Internal Affairs and Administration about the prices stated in the bids received and send the Minister a copy of the best offer
-- documents regarding a public offer must be kept for three years after the closing of a tender
-- regulations have been introduced on rejecting a bid, annulling certain procurement procedures, publishing the announcement of the public order, defining the resources of payment, construction work, and the value of the order
-- the President of the Public Procurement Office is now authorized to scrutinize blatant violations of the law and to refer such cases to the appropriate authorities

Regulations regarding procedures that must be followed when bids are filed after the tender deadline passes and deposit payments remain unchanged.

For further information on the Law of Public Orders and the recent amendments to it, please contact:

Urzad Zamowien Publicznych
al. J. Ch. Szucha 2/4
00-582 Warsaw
Tel: (48)(22)694-7141
Fax: (22)(22)629-1632

2. Procurement financed by multilateral bank loans (World Bank, EBRD) is made according to the procedures applicable for these organizations, i.e., tender process requiring international bidding. All large procurement self-financed by a purchaser are made through the bidding mechanism according to one of the following methods: unlimited tendering, limited tendering, two-stage tendering, negotiations with competition, preliminary qualification. Invitations to bid are available to all interested suppliers on the qualified suppliers list. Under the clauses allowing for limited tendering, invitations must be sent to at least four known suppliers. For negotiations with competition, the minimum bid count is three.

VII. Means of Financing Procurements

The following sources of financing are available for procurement in energy sector:

1. Self-financing and commercial loans are the basic source of financing in this sector
2. Multilateral bank loans - World Bank and EBRD

World Bank lending in the energy sector supports continuing government of Poland efforts to increase the efficiency with which Poland uses energy, updating and modernizing the sector's legal and institutional framework, and restructuing of key subsectors, including power, hard coal and gas. World Bank loans to Poland in the energy sector in 1990-1999 totaled over $1 billion. These loans were directed for projects in energy resources development, heat supply restructuring, power transmission, rehabilitation and modernization of the power generation facilities, district heating modernization and renewable energy projects, including use of geothermal energy resources.

EBRD has granted a $20.5 million credit line to Wielkopolski Bank Kredytowy WBK for on lending to district heating enterprises involved in the production and sale of heat and steam. The loans are targeted at restructuring and modernization of local heating enterprises leading to environmental improvements and greater energy efficiency. EBRD has also supported investments in energy efficiency through a program which develops Energy Services Companies (ESCOs). The first ESCO activities are emerging and appear to be promising. The national energy conservation agency has strongly promoted the idea of ESCOs and sees it as central to its strategy for the development of energy efficiency in Poland. There are a number of sources of concessionary finance for energy efficiency. The National and Regional Environmental and Water Protection Funds provide loans at below market interest rates for energy efficiency investments.

3. Development funds for energy modernization projects (e.g., fund with sources gained through privatization of power sector enterprises).

4. National Bank for Environmental Protection and ECOFUND for project qualified as environmental protection; these organizations offer grants or preferential interest loans.

5. Provincial funds for environmental protection.

VIII. Points of Contact

A) U.S. Department of Commerce

Jim Wilson
Director, Energy Department
Trade Development Office
International Trade Administration
U.S. Department of Commerce
14th and Constitution
Washington, D.C. 20230

tel. 202-482-3492
fax. 202-482-0170

B) American Embassy

David Fulton
Senior Commercial Officer
U.S. Commercial Service
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C) Host Government

Ministry of Economy
Plac Trzech Krzyzy 5

00-507 Warszawa
Janusz Steinhoff, Minister
tel. (48)(22) 628-73-27
fax. (48)(22) 629-52-01

Jan Szlazak, Under Secretary (responsible for energy sector)
tel. (48)(22) 693-58-63
fax. (48)(22) 629-52-01

Wojciech Tabis, Director
Department of Energy and Environment
tel. (48)(22) 621-11-64
fax. (480(22) 629-11-67
Jerzy Łatkowski, Vice Director for Electrical Power Industry
tel. (48)(22) 629-11-78
fax. (48)(22) 628-08-82

Ministry of Environmental Protection
ul. Wawelska 52/54
00-922 Warszawa
Antoni Tokarczuk, Minister
tel. (48)(22) 825-33-55
fax. (48)(22) 825-33-26

Jacek Jezierski, Director
Geology Department
Tel. (48)(22) 825 2087
Fax. (48)(22) 825 1503

Ministry of State Treasury
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Warszawa
Emil Wasacz, Minister
tel. (48)(22) 628-16-89
fax. (48)(22) 628-19-14
Jan Buczkowski, Under Secretary of State
tel. (48)(22) 695-85-65
fax. (48) (22) 628-19-14

Energy Regulatory Agency
ul. Chłodna 64
00-872 Warszawa
tel. (48)(22) 66-16-302
fax. (48)(22) 66-16-300
Leszek Juchniewicz, President
Foreign Cooperation and European Integration Bureau
tel. (48)(22) 66-16-315
fax. (48)(22) 66-16-321

IX. Additional Sources of Information on Sector

Polish Power Grid Company
ul. Mysia 2
00-496 Warsaw, Poland
Krzysztof Zmijewski
President of Board
tel. (48)(22)621-49-04, 693-21-17
fax. (48)(22) 628-59-64

Malgorzata Klawe
Vice Director of Strategy Department
Polish Power Grid Company
ul. Mysia 2
00-496 Warsaw, Poland
tel. (48)(22)693-2052
fax. (48)(22) 693-2550

Polish Oil and Gas Company POGC
ul. Krucza 6/14
00-537 Warsaw, Poland
Stefan Geron
Director General
tel. (48)(22) 628-16-42
fax. (48)(22) 623-50-50
Boleslaw Rey
Director of Foreign Relations Bureau
tel. (48)(22) 583-55-61
fax. (48)(22) 583-50-50

EuRoPol GAZ S.A.
Russia-Western Europe Gas Transit Pipeline
Al. Stanow Zjednoczonych 61
04-028 Warszawa
Kazimierz Adamczyk, President
tel. (48)(22) 5174100
fax. (48)(22) 5174040
Danuta Tarkowska, Director
Foreign Cooperation Department of EuRoPol GAZ S.A.
tel. (48)(22) 517 4231
fax. (48)(22) 517 4040

Oil Pipeline Exploitation Company PERN
ul. Kazimierza Wielkiego 2a
09-400 Plock
Henryk Janczewski, President
tel/fax. (48)(22) 262 6299

Polski Koncern Naftowy PKN S.A.
Polish Oil Concern
ul. Chemikow 7
09-411 Plock
Andrzej Modrzejeski, President
tel. (48)(24) 365-3150
fax. (48)(24) 365 4040

PKN S.A. Warsaw Branch
ul. Flory 3
tel. (48)(22) 849 3361

Nafta Polska S.A.
Polish Oil Company
Ul. Jasna 12
00-013 Warszawa
Grzegorz Zarebski, President
tel. (48)(22) 826 1579
fax. (48)(22) 827 3105

Financial Institutions Involved in Energy Sector

World Bank
ul. Emilii Plater 53
00-193 Warszawa
tel. (48)(22) 520 8029
fax. (48)(22) 520 8001
Pawel Kaminski, Energy Sector Operations Officer

EBRD Resident Office
Emilii Plater 53
00-113 Warszawa
tel. (48)(22) 520 57 00
fax. (48)(22) 520 58 00
Kazimierz Przelomski, Senior Banker (Energy Sector)

Narodowy Fundusz Ochrony Srodowiska
ul. Konstruktorska 3a
Warszawa
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Fax. (48)(22)849-72-72
Maria Zajaczkowska, President

EcoFund
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Maciej Nowicki, President

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Wojciech Cetnarski, President

Commercial Chambers and Associations

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Polskie Towarzystwo Elektrocieplowni Zawodowych
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fax. (48)(22) 628-69-93
Janusz Ryk, Director

Chamber of Industrial Power Plants
Izba Energetyki Przemysłowej
00-973 Warszawa
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tel/fax. (48)(22) 668-74-76
Andrzej Janczewski, Director
Czesław Seliga, President

Polish Power Transmission and Distribution Association
ul. Nowowiejskiego 10
60-967 Poznan, Poland
tel. (48)(61) 856-10-60
fax. (48)(22) 856-10-67
Dariusz Lubera, President

Peak Pump Power Plant Association
Elektrownie Szczytowo-Pompowe S.A.
ul. Panska 73
Warszawa
tel. (48)(22) 620 11 81, 693 21 59
fax. (48)(22) 624 25 55
Jan Tokarz, President
Krzysztof Kruszewski, Investment Director

Research Institutes and Foundations

Institute of Power Engineering
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02-981 Warszawa
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Jacek Wańkowicz, Director

Power Research Institute
Instytut Energetyki
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01-330 Warszawa
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Jacek Wańkowicz, Director

Polish Association for Solar Energy
Polskie Towarzystwo Energetyki Slonecznej
IPPT PAN
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Wojciech Dzieniszewski, Director

Foundation for Solar Energy
Fundacja Energetyki Slonecznej
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Zbigniew Grzegorzewski, President

Polish Foundation for Energy Efficiency
Fundacja na Rzecz Efektywnego Wykorzystania Energii
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Ewaryst Hille, Vice President

National Energy Conservation Agency
Narodowa Agencja Poszanowania Energii
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00-611 Warszawa
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fax. (48)(22) 825-86-70
Aleksander Panek, President

Attachment: Harmonized Codes of Equipment Used for This Report

1. Electric Power Equipment

8401	Nuclear Reactors
8402	Steam and other vapor generating boilers
8403	Central heating boilers
8404	Auxiliary plant for use with boilers
8406.19	Steam turbines and other vapor turbines
8406.90	Parts of steam turbines
8407.90.40	Spark-ignition reciprocating for rotary internal combustion piston engines exceeding 0.7 kw.
8408.90.90	Compressing-ignition reciprocating or rotary internal combustion piston engines (diesel or semi-diesel) exceeding 1,119 kw
8410	Hydraulic turbines, water wheels and regulators therefore; parts thereof;
8411.82.80	Turbojets, turbopropellers and other gas turbines and parts thereof of a power exceeding 5,000 kw
8411.99.90	Parts of nonaircraft gas turbines (rotors/spindlers and others)
8413.81.00	Turbine pumps
8502	Electric generating sets and rotary convertors
8504.33.00	Electric transformers having a power handling capacity exceeding 500 KVA
8537.20.00	Boards, panels for electric control or distribution of electricity for a voltage exceeding 1,000 V

2. Oil and Gas Equipment

7304.10	Tubes, pipes and hollow profiles, seamless of iron and steel (line pipe) of a kind used for oil and gas pipelines
7304.20	Casing, tubing and drill pipe, of a kind used in drilling for oil and gas
8413.40.00	Reciprocating concrete pumps
8413.50.00	Reciprocating oil well and oil field pumps
8413.60.00	Rotary displacement oil well and oil field pumps
8421.29.00	Oil & Gas separation equipment
8421.29.00	Gas separation equipment
8430.49.40	Offshore oil and natural gas drilling and production platforms
8430.49.80	Oil and gas field and well drilling equipment (rotary and other)
8431.39.00	Parts suitable for use solely or principally with oil and gas machinery
8479.89.90	Oil and gas field wire line and downhole equipment